



Summaries - Proceedings
THE SIXTH MEETING OF THE EUROPEAN CLAY GROUPS
Seville, Spain, 1987. Sociedad Española de Arcillas

VARIATION IN MICROORGANIZATION AND PROPERTIES OF SANTA OLALLA VERMICULITE WITH DECREASING SIZE

M. Robert* , J. Ranger**, P.B. Malla***, D. Tessier*
and J.L. Perez Rodriguez****

* Station de Science du Sol, INRA 78000, Versailles

** Station des Sols Forestiers, INRA 54000, Nancy

*** Department of Soils and Crops Rutgers, University New Jersey, USA

****Centro Edafologia Sevilla, Spain

Various samples (coarse and fine fractions) of Santa Olalla vermiculite were collected in a Mine near Sevilla (Spain). They were separated according to size and submitted to chemical, mineralogical (XRD, DTA), and microscopic (HRTEM) studies.

The coarse fraction is a pure reference vermiculite and shows all as typical XRD reflection.

Inside the clay fraction two different complexes with ethylene glycol giving 14 and 17 Å can be observed. Using alkylammonium complexes (Lagaly and Weiss, 1969 ; Malla and Douglas, 1986) it is also possible to identify two different 2/1 clay minerals with different charges 0.70 and 0.54 on each side of the vermiculite-smectite border.

The results are compared with those obtained by total chemical analysis and calculation of structural formulae.

By observing ultrathin sections of the clay fraction (coarse and fine) we can characterize the microorganization of natural vermiculite clay which has thick packs of layers of great lateral extension.

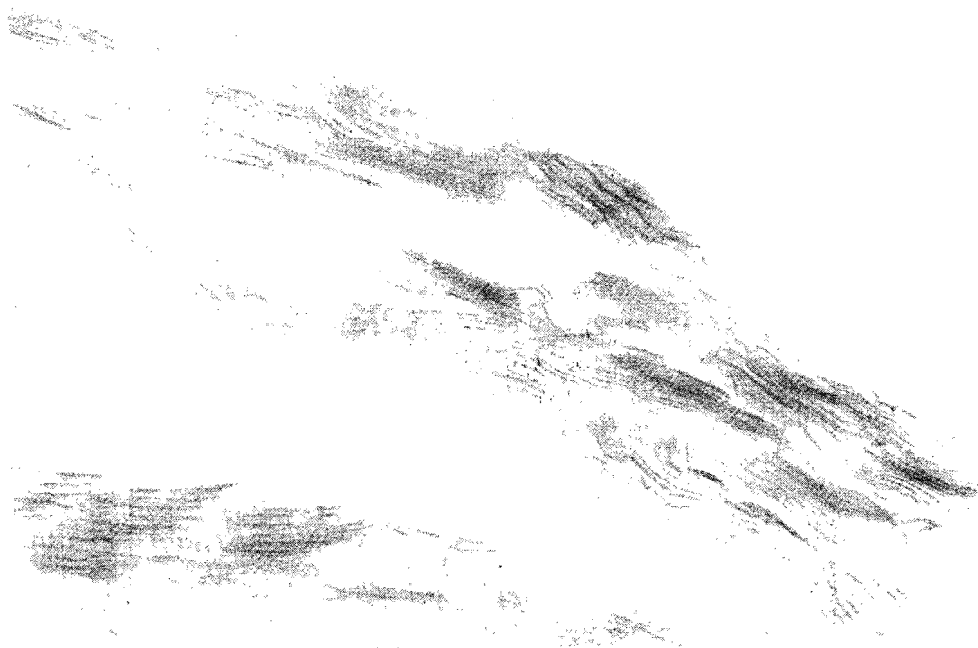
Evolution of this organization with decreasing size and charge is studied and a comparison is done with smectite microorganization (Tessier, 1984).

REFERENCES

Lagaly G. and Weiss A. (1969) - Determination of the layer charge in mica type layer silicates. Proc. Int. Clay Conf. Tokyo. I. Israël Univ. Press, Jerusalem, 61-80

Malla P.B. and Douglas L.A. (1986) - Identification of expanding layer silicates : layer charge expansion properties. Proc. Inter. Clay Conf. Denver, USA, 29-85 (in press)

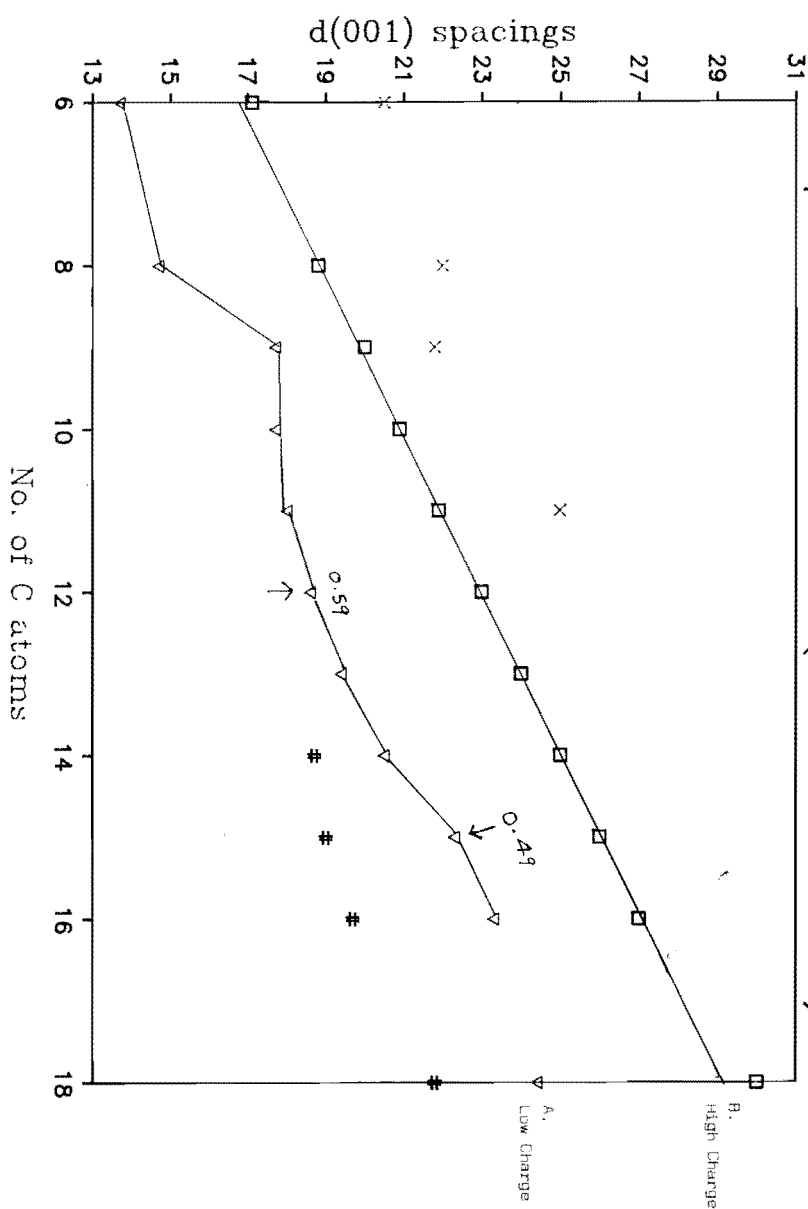
Tessier D. (1984) - Etude expérimentale de l'organisation des minéraux argileux. Hydratation, gonflement et structuration au cours de la dessiccation et de la réhumectation. Thèse d'Etat, Univ. Paris VII, 361 p.



100 nm

HRTEM Aspect of vermiculite clay fraction with alkyl ammonium

Spanish Vermiculite (<2 μ m fraction)



layer charge determination by alkyl ammonium method